Online Journal of Health and Allied Sciences
Peer Reviewed, Open Access, Free Online Journal
Published Quarterly : Mangalore, South India : ISSN 0972-5997
Volume 8, Issue 4; Oct - Dec 2009

Review:

Application of Qualitative Methods in Health Research: An Overview

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Citation: Dongre AR, Deshmukh PR, Kalaiselvan G, Upadhyaya S. Application of Qualitative Methods in Health Research: An Overview. *Online J Health Allied Scs.* 2009;8(4):3
URL: http://www.ojhas.org/issue32/2009-4-3.htm
Open Access Archives: http://cogprints.org/view/subjects/OJHAS.html and http://openmed.nic.in/view/subjects/ojhas.html

Submitted: Oct 5, 2009; Accepted: Mar 31, 2010; Published: Apr 30, 2010

Abstract:
Qualitative research is type of formative research that includes specialized techniques for obtaining in-depth responses about what people think and how they feel. It is seen as the research that seeks answer to the questions in the real world. Qualitative researchers gather what they see, hear, read from people and places, from events and activities, with the purpose to learn about the community and to generate new understanding that can be used by the social world. Qualitative research have often been conducted to answer the question "why" rather than "what". A purpose of qualitative research is the construction of new understanding. Here, we present an overview of application of qualitative methods in health research. We have discussed here the different types of qualitative methods and how we and others have used them in different settings/scenarios; sample size and sampling techniques; analysis of qualitative data; validity in qualitative research; and ethical issues.
Key Words: Participatory research techniques, PRA, In-depth techniques, systematic techniques

Introduction:

Qualitative research is type of formative research that includes specialized techniques for obtaining in-depth responses about what people think and how they feel. It is seen as the research that seeks answer to the questions in the real world. Qualitative researchers gather what they see, hear, read from people and places, from events and activities, with the purpose to learn about the community and to generate new understanding that can be used by the social world.[1] Qualitative research have often been conducted to answer the question "why" rather than "what". A purpose of qualitative research is the construction (not the discovery) of new understanding. A skillful use of logically sequenced different techniques of data collection can maximize the validity of the data and provides in-depth understanding of emotional and contextual aspect of human responses rather than objective and measurable aspect.

Historically, qualitative research methods have their roots in several disciplines; literary criticisms, social sciences and psychoanalytic theory. However, in recent years, there has been a revival of interest about qualitative research methods in the field of public health. Over the last decade there has been an increase in the use of qualitative research methods in health research.[2] Some of the important reasons for this revival of interest are: 1) growing realization of unsuitability of survey research methods in the context of developing countries where population is predominantly illiterate and where magnitude of non-sampling errors is high in surveys, 2) increased interdisciplinary team work and 3) demand of quick results from the ethnographic work.[3]

The latest trend in the field of research is the combined use of quantitative and qualitative research methods i.e. mixed-method design within a single data set. According to Morse (2005), it is in this area that the largest abuses of qualitative data are occurring, largely because methodological principles have not been followed. Hence, it is necessary to understand the methods of qualitative data collection and its analysis.[4] The present article provides the brief descriptive overview on application for qualitative research methods in health research.

Types of qualitative methods:

The qualitative data collection techniques range from the highly structured systematic techniques to the highly flexible people-centered participatory techniques. These can be broadly classified under 3 major headings:[3]

Participatory research (PR) techniques: In conventional research, knowledge is generated by the researchers for their academic pursuit and the study subjects have no control over it. Participatory methods offer collective educational process which involves people as stakeholders for their empowerment and assumes that the ordinary people already possess knowledge and have an understanding of their reality which is generated during their on-going struggle for survival. PR process intends to change existing local problems and synthesize local people's knowledge with existing scientific knowledge.

Apart from addressing the pressing social and economic issues like poverty, poor land irrigation, forestry, housing and water supply etc, PR is increasingly being used for community based health and development project. Here, the local community members are involved in needs assessment and develop a priority based health plan and act upon it. Most frequently used

participatory methods are Social Mapping, Pair Wise Ranking, Seasonal Calendar, Cobweb Diagram, Trend Analysis, Venn Diagram and Transect Walk.[5]

A non-government organization, Mother and Infant Research Activities (MIRA) in rural Nepal, involved women self help groups through participatory research for planning perinatal care services.[6] In rural India, Community led Initiatives for Child Survival (CLICS) project involved community members through participatory research and action on key maternal and child health issues.[7] In a study on health care seeking for newborn danger signs in periurban Wardha, mapping exercises were undertaken to identify the respondents and pair wise ranking exercise prioritized mothers' preferences for the available health care services for sick newborn.[8] In rural Wardha, an exploratory Venn diagram exercise (*chapatti* diagram) with Anganwadi workers brought out their perceived job responsibilities and the seasonal calendar exercise with the mothers of severely malnourished children explored the seasonality of childhood illness, availability of money, free time, food and access to loan across twelve months in a year.[9] A participatory research and action for rural adolescent girls could involve adolescent girls to improve their practices related to menstrual hygiene and explored the trend of change over the period by using trend analysis techniques.[10] A transect walk with primary school teachers in village Dhotra (Kasar) could explore the villagers personal hygiene practices which was used to devise a need based health education intervention for school children with active involvement of school teachers and children.[11]Noteworthy, PR ensures local people's participation in research and action process and strengthens their action-experience-learning cycle. Hence, participatory research techniques offer wider scope and should not be seen as mere data collection tools.

In-depth techniques*:* These are qualitative in-depth flexible discussions or interviews with the group or person who knows what is going in community about the topic on which we want to get information. These methods are widely used for exploring sensitive topics in medical education, demography and public health etc. Some commonly used methods are Focus Group Discussion (FGD), Key Informant Interviews (KII) and In-depth Interview (IDI).[12]

A study on newborn care practices in slums of Delhi undertook KII and IDI of caregivers for exploring their health care seeking behavior for newborn danger signs.[13] In rural Vietnam, Huy TQ et al undertook FGDs to explore socio-cultural and health systems factors that may impact on death reporting by lay people to registry systems at the commune level.[14] Program for Appropriate Technology in Health (PATH) have given guidelines for development of health education material where FGDs are advised for needs assessment for health message development.[15] Health education materials based on such guidelines have been found effective in the field settings.[16]

Systematic techniques*:* These techniques can be used with almost any qualitative research methods such as focus group or participatory research to collect systematic and structured data on a specific research issue. This approach is based on the principle that people make sense of their words by grouping their observation or experiences in class known as "domain". Examples are Free listing combined with Pile sorting, Delphi panel.[12] Free list combined with pile sort can be used for exploring the perceptions of local people on a given research topic in a systematic manner. Free list exercise can be undertaken as a pre-survey qualitative research for exploring local terms for locally relevant questionnaire on a relatively new topic or if researchers are unknown about its underlying dynamics in the study area.

In qualitative research for exploration for various reasons for malnutrition, free list and pile sort exercise were used with the Anganwadi workers and FGDs were facilitated with the group of mothers to their opinion about supplementary food.[17] A combination free list and pile sort exercise was used for knowing the rural mothers' perceptions for newborn danger signs and their household level care practices.[17] In another community based participatory research and action similar combination was used for understanding the rationale for changed health care seeking for newborn danger signs in rural Wardha.[7]

Sample size and sampling techniques:[18]

Sample size: It is difficult to determine sample size and there is no mathematical formula to calculate sample size in qualitative research. It depends on the purpose of the study and available resources. The validity, meaningfulness and insights generated from the qualitative data have more to do with the richness of the data obtained. The process of data collection is continued till the saturation point i.e. where no new information is added after the additional interviews or focus group discussions. Since there is no sample size estimation and there is use of non-probability sampling in qualitative research, the findings are rarely used to test the hypothesis and generally it directs the future course of research on relatively new or rare topic by generating research hypothesis.

Sampling techniques: Sampling is a scientific way of selecting study subjects. Since the purpose of qualitative research is to find out answer to the question why, and explore different perspectives on the research topic by generating rich textual data, **Non-probability sampling** is recommended. The examples of non-probability sampling are as follows. **1) Purposive sampling**, where sample units are selected with definite purpose in view, e.g. women who adopted different methods of contraception, victims of some events. **2) Convenient sampling**, where the conveniently available respondents are selected, e.g. women in field, temple or common meeting place. **3) Quota sampling** is a restricted type of convenient or purposive sampling defining the quota of sample to be drawn from different strata and then drawing the required sample. **4)** In **Snow-ball sampling,** the sample is driven by the respondents. It involves asking your respondents to identify other potential participant with specific set of characteristics and then asking the next respondent. It is used when the target population is unknown or difficult to approach, e.g. such as Male having Sex with Male (MSM) population and Sex workers etc.

Sequencing of the methods[3,5]: The qualitative data collection should be 'on-going' or 'iterative' process. Hence, methods should be logically sequenced where one method directs the other, for example, you identify potential respondents for focus group discussion during social mapping exercise. This triangulation of qualitative methods ensures better validity of the results and adds to the richness of qualitative data. In mixed methods design, triangulation quantitative (survey) and qualitative research method is undertaken into the same research design. Pre-survey qualitative research is undertaken for better pre understanding of the underlying dynamic on given research topic in study area, for exploring local terms on research topic and developing locally relevant questionnaire. FGDs are undertaken as needs assessment for designing locally relevant behavior change strategy. Post- survey qualitative research is undertaken to bridge the gaps of information in survey.

Analysis of qualitative data:[19]

Data analysis in qualitative research is a multi-faceted endeavor. It requires planning, capacity for being open to views that are different from your very own, an appreciation of provisional nature of human knowledge, strong conceptual skills and excellent scholarship. Let us understand the language and terminology of qualitative data analysis.

Interim analysis: The qualitative data analysis is an on-going and iterative (non-linear) process in qualitative research. This is known an interim analysis. It is cyclical process of collecting data and analyzing it during a single research study. Interim analysis continues until the process or topic the researcher is interested in is understood (or the investigator runs out of time and resources).

Memo: Throughout the entire process of qualitative data analysis it is good idea to engage in writing the memos. It is recording of the "reflective notes" about what you are learning from your data. The idea is to write memos to you when you have idea or thought and include those memos as 'additional data' to be analyzed.

Coding: It is defined as making the segments of data with symbols, descriptive words or category name. A master list of codes is developed and applied to new segments of data each time an appropriate segment is encountered. A 'priori' codes are developed before examining the current data and 'inductive' codes are developed by the researcher by direct examining the data.

Content analysis*:* It is a widely used qualitative research technique for subjective interpretation of content of text data through the systematic classification process of coding and identifying themes or patterns. Content analysis has three distinct approaches: conventional, directed, or summative. All three approaches are used to interpret meaning from the content of text data and, hence, adhere to the naturalistic paradigm. The major differences among the approaches are coding schemes, origin of codes and threats to trustworthiness. In conventional content analysis, coding categories are derived directly from the text data. With directed approach, analysis starts with a theory or relevant counting and comparisons, usually key words or content, followed by the interpretation of the underlying context.

Steps in the process of content analysis:
For qualitative research, triangulation of multiple methods and investigators is recommended for better interpretation and validity of the findings.

Step1: Transcription*:* The raw data is collected as notes or audio or video recordings. This needs to be transformed into written text format for the purpose of analysis.

Step 2: Deciding the unit of analysis: Defining the coding unit is one of the most fundamental and important step. The commonly used coding units are word, concept, sentence, paragraph and theme. Changes in coding unit will affect coding decisions as well as comparability of outcomes with other similar studies.

Step 3: From units to categories*:* Categories and code schemes can be derived from three sources such as 1) data itself, 2) previous related studies, 3) theories. Inductive coding is done when researcher intend to develop theory rather than describing phenomenon or verifying existing theories.

Step 4: Test coding on sample test: To ensure coding consistency especially when multiple coders are involved, development of instruction guidelines defining rules of coding is essential. If there is low inter-coder agreement then revise the rules of coding sample text and checking coding consistency.

Step 5: Code all text data: When sufficient consistency is achieved then coding rules can be applied to code all the text data.

Step 6: Assess the coding consistency*:* After coding all text data, coding consistency needs to be re-checked. Human coders are subject to fatigue and are likely to make mistakes as coding proceeds. Inter-coder agreement is needed in content analysis because it measures only the extent to which the different judges tend to assign exactly the same rating to each object. It is assessed by calculating statistics such as Cohen's kappa, Scott's pi, Holsti's coefficient of reliability and Krippendorff's alpha. Coefficients of .90 or greater are nearly always acceptable, .80 or greater is acceptable in most situations, and .70 may be appropriate in some exploratory studies for some indices. Higher criteria should be used for indices known to be liberal (i.e., percent agreement) and lower criteria can be used for indices known to be more conservative.[20]

Step 7: Drawing conclusions from the coded data: This is a crux of qualitative data analysis. It involves reading and re-reading of text data. The activities involve exploring properties and dimensions of categories and identify relationships between categories.

Step 8: Reporting*:* While writing report it is important to maintain the balance between description and interpretation. Here, one can use conceptual frameworks derived from the data set. An interesting and readable report provides sufficient description to allow the reader to understand the basis for an interpretation and sufficient interpretation to allow the readers to understand the description. Tong et al noted that there is no criteria for reporting qualitative research findings and suggested 32-item check list as Consolidated criteria for Reporting Qualitative research (COREQ) under three main domains 1) Research team & reflexivity 2) Study design 3) Analysis and findings.[21]

Use of software in analysis of qualitative data: Traditionally, qualitative data were analyzed "by hand" using some form of filing system. For smaller data set manual content analysis is undertaken. Here, coding is done manually along a narrow blank column of the text document. A computer assisted coding using software packages (that are specifically designed for qualitative data and analysis) has significantly reduced the need for the traditional filing technique. The most popular qualitative data analysis packages are NUDIST, ATLAS-ti, and Ethnograph. ATLAS-ti 5.0 and NVivo 2.0 are among the best available and potentially most useful qualitative data analysis (QDA) tools. Both are tremendously flexible programs that can be readily applied in wide range of applications. Noteworthy, computer aided content analysis should not be seen as a shortcut to various steps of qualitative data analysis.

Methods to ensure validity in qualitative research:
Some commonly used strategies to promote trustworthiness and validity in the findings of qualitative research are given below.[22]

Researcher as detective: The researcher has to develop the understanding of the data through careful consideration of potential causes and effects by systematically eliminating the rival explanations and hypothesis until the final cause is made beyond a reasonable doubt.

Extended field work: For both discovery and validation, the researcher should collect data in the field over the extended period of time.

Low-inference descriptors: The use of descriptions phrased very close to the participant's account or researcher's field notes. Verbatim i.e. direct quotations are used as low-inference descriptors.

Triangulation: Cross-checking of information and conclusions through the use of multiple procedures and sources may be undertaken for valid results. A combination of multiple methods to study a phenomenon gives a better and in-depth understanding of the research question. A use of multiple investigators to collect and interpret data adds to the validity of the results.

Participant feedback: The feedback and discussion on the researcher's interpretation and conclusions with actual parti-

cipants and other members of the community helps in verification and better insight into the research problem.

Peer-review: It is recommended to discuss the findings with the disinterested peer e.g. other researcher who is not directly involved. Peer should be skeptical and play the devil's advocate, challenging the researcher to provide solid evidence for any interpretation or conclusion.

Ethical issues in qualitative research:

There is increase in publications on qualitative research methods. Qualitative research is vulnerable to bias through the attitude and qualities of the researcher, social desirability factor, and conditions of worth.[23] Except with few exceptions of nursing, sociological and anthropological literature,[24] no published articles on qualitative methods in medical research addressed ethical issues. In India, Indian Council of Medical Research (ICMR) has provided ethical guidelines for biomedical research on human subjects without specific reference to qualitative research. Richards et al[24] have argued need for ethical guidelines for qualitative research in health sciences. Unlike social scientists, health professionals have poor orientation to philosophical aspect of research. Also, ethical committees have difficulty assessing ethical issues arising in relation to qualitative studies.[25] Time for research exercise should be decided in consultation with the participant. Consent should be obtained and refreshment should be arranged at the end of focus group discussion. Examination of self through critical reflection and supervision are necessary component of ethical research.[23]

To summarize, the application of qualitative research methods in health research is increasingly been seen. There are now criteria for reporting qualitative research findings (COREQ), a 32-item checklist, which can help researchers to report important aspects of the research team, study methods, context of the study, findings, analysis and interpretations. Subsequent research on this check-list is required to improve the quality of reporting. The training of the health care providers and researchers should be done on application of these methods in their work settings. Also ethical guidelines should be developed for use of qualitative research methods in research.

Disclaimer:

The views expressed in this article are those of the author in his professional capacity, and do not necessarily reflect those of the U.S. Agency for International Development or of the U.S. Government.

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